EPSON®
Technical Brief

Impact Printers

Contents

This technical brief provides detailed information on the following topics, related to all EPSON impact printers:

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  - Off-carriage motor assembly

Functionality—Printing technology

Why buy an impact printer? An impact printer has several advantages over any other type of printer:

- Low cost — both in purchase price and low cost of ownership
- Flexible paper handling — only impact printers can handle multi-part forms and multiple paper paths that can all have paper loaded and waiting.
- Reliability — EPSON impact printers are renowned for their reliability with tireless printheads and superior quality ribbons.

Impact printers are either 9- or 24-pin, which determines the type of printing and the number of multi-part forms that the printer are capable of printing.

Nine-pin impact printers — These printers have the sturdiest printhead pins which:

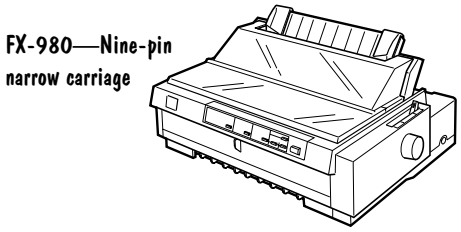
- Hit the paper hard to make impressions through the thickest multi-part forms
- Offer the fastest print speeds
- Print from High Speed Draft up to Near Letter Quality

Twenty-four-pin impact printers — These printers have finer printhead pins which:

- Hit the paper less hard to make impressions through most multi-part forms
- Offer finer Letter Quality printing
- Print from High Speed Draft up to Letter Quality

The name of an EPSON's impact printer tells you if it is a 9- or a 24-pin printer, and whether it has a narrow or wide carriage:

- Nine-pin printers all begin with FX, LX, or DFX
- Twenty-four pin printers all begin with LQ
- Wide carriage printers have 4 number in their names
- Narrow carriage printers have 3 numbers in their names


FX-980—Nine-pin narrow carriage

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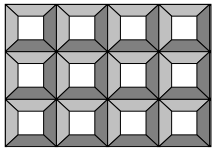
Functionality—Control code/emulation

All EPSON impact printers utilize EPSON Standard Code (ESC/P and ESC/P 2) printer control language, which is the industry standard for simple, efficient operation of impact printers.

EPSON 9-pin impact printers utilize ESC/P, the original printer control language.

EPSON 24-pin impact printers utilize ESC/P 2, which includes these additional features:

- Proportionally-spaced scalable fonts
- Enhanced graphics printing which prints with 360 dpi in a single pass of the print head and enhances printing with Windows applications.



Most EPSON impact printers also offer an IBM emulation, which allows more connectivity compatibility.

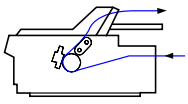
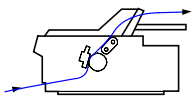
Functionality—Paper handling

Versatile paper handling allows EPSON impact printers to handle several different types of paper — many at the same time.

Tractor paper paths:

EPSON impact printers all include a rear tractor. In some models this tractor is moveable, and in some it is fixed. Some EPSON impact printers also include additional tractor units, and all of EPSON's impact printers have optional tractor units available.

The following chart explains the best use for the push tractor, pull tractor, and push/pull tractor combinations:

Push tractor	Pull tractor	Push/Pull tractor
Best for reports, forms, etc., and allows you to achieve zero tear-off and top of form adjustment (which allows you to tear off the printed document or form without wasting a sheet.) Available in front and rear paper paths. *Front push paper path* 	Gives you better control when printing on multi-part forms by ensuring that the forms stay properly aligned. Available in front, bottom and rear paper paths. *Bottom pull paper path* 	Gives you the greatest control when printing on multi-part forms by ensuring that the forms stay properly aligned and do not get jammed or misfed. *Two tractors hold the forms securely.*  Rear push/pull  Front push/pull

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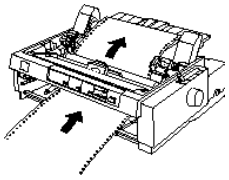
Single sheet paper paths:

EPSON impact printers all can handle single sheet paper and single sheet multi-part forms, many EPSON impact printers have both front and top paper paths:

Front paper path

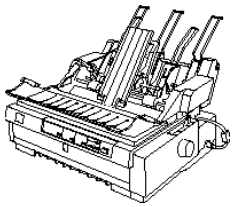
The front paper path has an almost straight-through paper path, which helps eliminate paper jams and minimizes misfeeds, especially when printing on multi-part forms.



Paper feed method	Type of paper
Front Paper Guide	Single sheets, single sheet labels, top- or side-bound single sheet multi-part forms

Top paper path

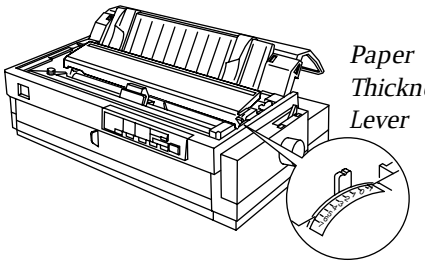
The top paper path accommodates single sheets, envelopes or postcards and optional cut sheet feeders.



Paper feed method	Type of paper
Top friction feed (standard paper guide) Optional high-capacity cut-sheet feeder Optional second-bin cut-sheet feeder	Single sheets, envelopes, or postcards.

Paper thickness adjustment:

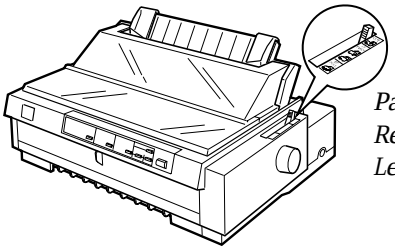
- Most EPSON impact printers have a Paper Thickness Lever that allows the printer to accommodate various thicknesses of paper.
- The DFX series EPSON impact printers have an Automatic Platten Gap Adjustment which automatically adjusts the platten to the thickness of the paper.



Paper Thickness Lever

Paper release lever positions:

- You can load continuous paper in the printer from various paper sources, such as the rear or front push tractors and use the paper release lever to indicate the paper source you want to use.



Paper Release Lever

Sample paper release lever chart

Paper release lever position	Description
CUT	Single-sheet position For loading single sheets from the top or front slot.
FF PUSH	Rear push tractor position For loading continuous paper from the tractor in the read push position. Set the lever to this position when using the rear push and pull tractor in combination.
	Front push tractor position For loading continuous paper from the tractor in the front push position. Set the lever to this position when using the front push and pull tractors in combination.
FF PULL	Pull tractor position For loading continuous paper from the tractor on top of the printer in the pull position. When the tractor is in the pull position, you can load paper in the front, rear, or bottom slot.

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Functionality—SmartPark™ settings

EPSON SmartPark settings, which help you save paper and trouble, and precisely line up documents, include automatic tear-off, paper parking, and microfeed adjustments.

Automatic tear-off

- Can be automatic or activated by a button on the control panel.
- After a document is printed, the printer will automatically advance the paper to the tear-off position.
- When the paper is torn off, or when another document is printed, paper is automatically retracted to the top-of-form position.

Paper parking

- Supports loading of paper from most paper paths, by pressing a button on the control panel.
- Paper from one path is backed out and "parked," while paper from the other path is loaded into printing position

Microfeed adjustments

- Can set a top-of-form setting within 1/180 of an inch, to precisely line-up printing on pre-printed forms.

Versatility—Flexible interfacing

Most EPSON impact printers offer both standard bidirectional parallel and serial interfaces which make the printers compatible with virtually any Windows system environment.

- Bundled Microsoft Windows® 3.1x, Windows NT 3.51/4.0, Windows 95 and Windows 98 drivers guarantees ease of use right out of the box.

For optional connectivity, most EPSON impact printers offer EPSON Type B interface slots that allow you to add:

Interface card	Description	Compatibility
32KB Serial	RS-232C serial port	PC/Macintosh
Serial	Standard serial port	PC/Macintosh
Coax	IBM® mainframe connection	PC
Twinax	IBM minicomputer connection	PC
Multiprotocol Series 2 & 100/ 10Base-TX Ethernet Print Server	Direct Ethernet/ EtherTalk network connection	PC/Macintosh
LocalTalk Interface board	AppleTalk connection	Macintosh

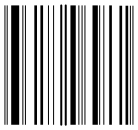
When an optional interface is added, EPSON impact printers automatic interface switching feature will automatically switch to the interface receiving data.

Versatility—Built-in fonts

Each EPSON impact printer includes a variety of built-in fonts.

DOS applications will take advantage of all of the built-in fonts that are available on a printer. EPSON impact printers offers these types of built-in fonts:

- Bitmap fonts—available on all EPSON impact printers
- Proportionally-spaced scalable fonts—selectable in 2-point increments, available on EPSON 24-pin impact printers
- Barcode fonts—available on most EPSON impact printers.



Barcode fonts are printed unidirectionally for accuracy

Windows applications will overide all built-in fonts in favor of the Windows fonts resident on your computer.

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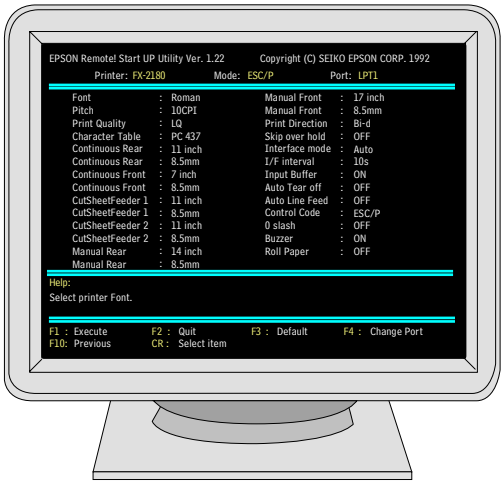
Versatility—Computer-based set-up

EPSON Remote! Utility

EPSON Remote! is the DOS-based printer setup utility that allows you to easily change the printer's default settings.

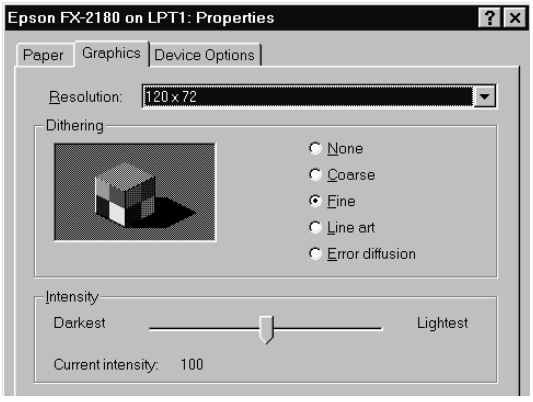
- Simplifies setup when installing multiple printers–just make the necessary changes in the software utility, and download the settings to each printer


EPSON Remote! Start UP Utility Ver. 1.22 Copyright (C) SEIKO EPSON CORP. 1992
Printer: FX-2180 Mode: ESC/P Port: LPT1
Font : Roman
Pitch : 10CPI
Print Quality : LQ
Character Table : PC 437
Continuous Rear : 11 inch
Continuous Rear : 8.5mm
Continuous Front : 7 inch
Continuous Front : 8.5mm
CutSheetFeeder 1 : 11 inch
CutSheetFeeder 1 : 8.5mm
CutSheetFeeder 2 : 11 inch
CutSheetFeeder 2 : 8.5mm
Manual Rear : 14 inch
Manual Rear : 8.5mm
Manual Front : 17 inch
Manual Front : 8.5mm
Print Direction : Bi-d
Skip over hold : OFF
Interface mode : Auto
I/F interval : 10s
Input Buffer : ON
Auto Tear off : OFF
Auto Line Feed : OFF
Control Code : ESC/P
0 slash : OFF
Buzzer : ON
Roll Paper : OFF
Help:
Select printer Font.
F1 : Execute
F10: Previous
F2 : Quit
CR : Select item
F3 : Default
F4 : Change Port

Printer Status Monitor Utility

The Printer Status Monitor provides Windows 95/98 users with automatic error messaging for direct printer to host computer connection.

- This utility program provides printer status, error conditions, and trouble shooting instructions to the user.



Windows 3.51 and NT 4.0 users can add an optional Ethernet card to have access to the Printer Status Monitor.

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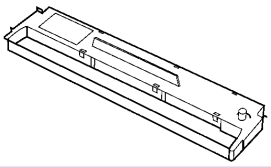
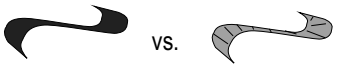
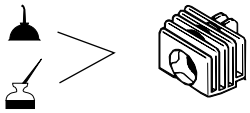
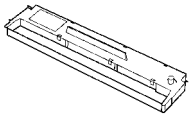
Reliability—Ribbon quality



EPSON brand impact printer ribbons are superior to the less expensive compatible ribbons.

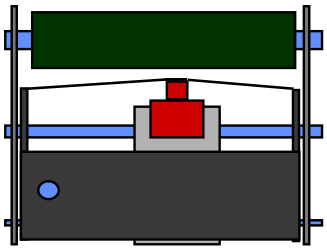
EPSON brand ribbons are ...	Customer advantages	
Manufactured with ink precisely applied to both sides of the ribbon nylon by computer-controlled machinery	Ensures consistent print quality throughout the life of the ribbon	a (First Character) a (2,000,000 th Character)
Made with the highest quality nylon manufactured	Ensures sharp printed edges Reduces fraying which can jam or damage the print head	
Made with the highest quality dyes, pigments, oils and a special lubricant	Protects and extends the life of the print head	
Available in a mylar film	Offers the highest print quality for dot matrix printers	Ultra Letter Quality
Made of the highest grade ABS plastic	Keeps the cartridge from warping during times of extended use and extreme temperature changes	
Easy to sell with every printer	Adds profit to every sale	$

Reliability—Ribbon cartridge reliability

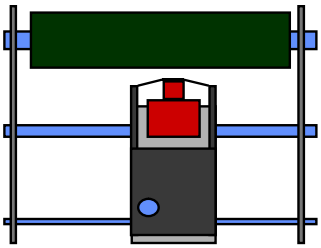
Most EPSON impact printers use a stationary ribbon cartridge. The design used in many competitive printers move the ribbon with the print head assembly unit. EPSON's stationary ribbon cartridge offers the following benefits:

- The stationary ribbon cartridge can be larger, since it doesn't have to move with the print head, and therefore has a longer life.
- Because the carriage does not have the extra weight of the ribbon, the printer can achieve faster print speeds.
- This lower weight on the carriage reduces the wear and tear on the motor, which gives the printer greater overall reliability.

EPSON's stationary ribbon cartridge



Competitive design with smaller ribbon on the print head



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Reliability—Total Print Volume vs. Mean Time Between Failures

EPSON impact printers are more accurately rated for reliability in Total Print Volume, and are also rated in Mean Time Between Failures.

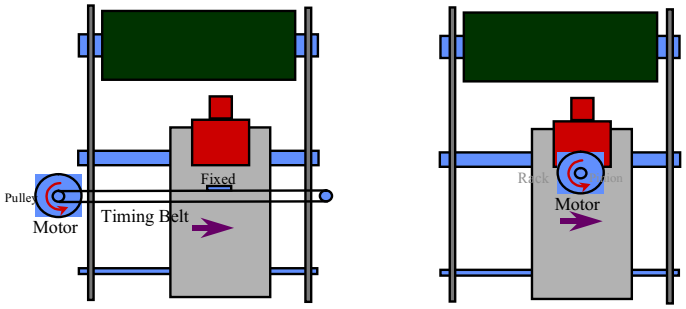
- Total Print Volume estimates the total number of lines that the printer can print before it may fail.
- Mean Time Between Failures estimates the number of hours between failures at 25 percent usage and 35 percent density, which can vary depending on printing conditions, and is much less accurate than Total Print Volume.

Reliability—Off-carriage motor assembly

Most EPSON impact printers use an off-carriage motor assembly, versus the on-carriage motor used in competitive printers.

- The off-carriage motor allows the print head to reach top speed more quickly and stop more quickly because it is not carrying the extra motor weight.
- Because just the print head moves, there is less wear and tear on the motor for greater overall reliability.

Off-carriage motor *On-carriage motor*



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